Point Loma Nazarene University
CSC 302: Python and UNIX Scripting (2 units)
Spring 2018

Instructor:

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Office hours:

MWF 12:30-2:151:00-2:00 T 11:00-11:45
F 8:00-9:30 R 11:00 - 1:00

Course Time and Location:

TR 10:00-10:50, LA 2

Text:

Practical Computing for Biologists, Haddock and Dunn.

Additional Supplies:

Raspberry Pi, Power Supply, Software or MAC laptop or PC with VM

Catalog Description

An introduction to UNIX and Python scripting in the context of applications to scientific research. Students will become competent users of the UNIX operating system. They will learn to find and manipulate data from various file formats (including text, FASTA, HTML, XML) using regular expressions with UNIX and Python scripts. They will learn to use Python for data analysis and for more specialized purposes using third party modules including NumPy, BioPython, and Tkinter.

Class Learning Outcomes:

- Students will be able to write correct and robust software.
- Students will be able to apply their technical knowledge to solve problems.

Course Organization:

Lectures: Cover the highlights of chapters assigned – not a substitute for reading. Student versions of the lecture slides can be obtained from Canvas. These slides will contain suggested homework problems and due dates.

Labs: Lab assignments may be completed individually, or in pairs. If you are working in a pair, please turn in only 1 lab with both names. Doing so is a statement by you that you truly worked together. If it becomes apparent that 1 of the team's members is not learning the lab material, permission to work as a team could be revoked. Furthermore, **if your lab looks too similar to someone who is not your partner, both parties could receive a zero on that assignment.** Note that leaning too heavily on the help of a lab assistant could result in an assignment that looks too much like another's. **No late labs are accepted.** However, I will drop the lowest lab grade and you may turn in any unfinished lab on time for partial credit.

3 minute interdisciplinary presentations: The expectation is that **everyone will do one 3 minute presentation** with peers providing a ranking, comments, and a summary. The 3-minute presentation is a presentation on something in your discipline, directed to people not in your discipline, providing a "just enough" understanding of a topic in words they can understand. The presentation as well as the audience summaries will be graded. Your presentation will hold the weight of 3 summaries. The 3 lowest summary scores will be dropped but your presentation score cannot be dropped. **Peer reviews will be completed via Canvas so please bring an**

internet-ready device to each class. Summaries cannot be made up but a missed presentation can be given the next class period for ½ credit.

Quizzes: In addition to the midterm and final exam, you will have 3 quizzes to help you keep current on both theory and practice. Quizzes are not cumulative but will cover material from both lecture and lab. Quizzes are scheduled for 1/30, 3/20 & 4/10 **If you miss a quiz without giving me prior notice for an excused function, there is a good chance you will receive a zero unless, of course, there was clearly an emergency.**

Exams: There will be 2 exams, a midterm and a final. If you will miss an exam for a school function, you must arrange to take it in advance. **If you ever miss an exam without giving me prior notice, there is a good chance you will receive a zero unless, of course, there was clearly an emergency.** Exam content can include material from lectures, the textbook, labs, and 3 minute presentations. Exams are cumulative**.** The midterm is scheduled for **Feb 20.** It will cover chapters 1 – 6 in your textbook.

The final exam is scheduled for **Tuesday of finals week at 10:30** and will emphasize chapters 8-10 in your textbook plus labs and lecture material covered since the last exam.

The **final exam date and time** is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

Grading:

3 min. presentations	15%	Labs	30%
Midterm	15%	Quizzes	15%
Final Exam	25%		

Final grades will be determined as follows:

100-93%	A	80-82.9%	B-	67-69.9%	D+
90-92.9%	A-	77-79.9%	C+	63-66.9%	D
87-89.9%	B+	73-76.9%	C	60-62.9%	D-
83-86.9%	B	70-72.9	C-	0-59.9%	F

University Mission:

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission:

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Attendance:

Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_ Attendance in the Undergraduate Academic Catalog.

Class Enrollment:

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Academic Accommodations:

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog: http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

Copyright Protected Materials:

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Credit Hour:

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 2 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

CSC 302 Expected Schedule Spring 2018

Mon	Tuesday	Wed	Thursday	Fri
	Jan 9 Monday sched	10	11 Syllabus Sign up for 3 minute presentations Intro Regular Expressions (ch: 1 ,2) **3 min: Text editors**	12
15 MLK	16 More regular expressions (ch 2) **3 min latitude longitude** **3 min on FASTA**	17	18 Regular expressions (ch 3) **3 min: periodic tables** **3 min: HTML**	19
22	23 More Regular Exp – custom char sets, boundaries Ch 3 **3 min: Voyager, Solar magnetic fields**	24	25 **3 min OS** **3 min Intro Linux/Unix** **3 min Virtual Machines**	26
29	30 **Quiz on REs** VM setup, Unix/Linux tutorial	31	Feb 1 More Unix (ch 4, 5) **3 min: CURL command** **3 min: IP address**	2
5	6 Chapter 5 Grep/IP lab	7	8 More Unix Unix scripting chapter 6	9
12	13 Additional Scripting (beyond book) Second scripting lab	14	15 Group review for Exam Begin Python (chapter 7)	16
19	20 **Midterm exam covering chapters 1-6**	21	22 Lab day	23
26	27 More python (chapter 8) **3 min: Codons, Amino Acids, Proteins** **3 min: taxonomic hierarchy**	28	Mar 1 More python (chapter 8) **3 min: DNA Melting** **3 min: ORFs** **3 min: Java functions**	2
5	6 Spring break	7	8 Spring break	9
12	13 More python (chapter 9)	14	15 More python (chapter 9) **3 min: Blast** **3 min: probability**	16
19	20 **Python quiz** **palindrome 3 min** **Restriction sites 3 min**	21	22 More Python	23
26	27 Python sets functions, files (ch 9) **3 min: Mathematical sets**	28	29 Easter Break	30
Apr. 2	3 Algorithm for next lab	4	5 Introduction to Turtle module, Biopython module	6
9	10 **Python quiz** Math module	11	12 More turtle **3 min: Sine, cosine, trajectory** **3 min: Earthquake magnitude**	13
16	17 **3 min: image processing** Introduction to image processing in Python using external modules	18	19 Image processing group work and lab	20
23	24 Image processing group work	25	26 Image processing presentations	27
Apr 30	May 1 Final exam 10:30	2	3	4